

## WHAT IS CLAIMED IS:

1. A method of paging in mobile communication systems, the method comprising the steps of:

5 a mobile terminal transmitting a location registration message to a mobile communication system.

the mobile communication system transmitting location information to a heterogeneous mobile communication system;

the heterogeneous mobile communication system requesting the mobile communication system to page the mobile terminal according to the received information.; and

the mobile communication system paging the mobile terminal.

2. The method as claimed in claim 1, further comprising a step of  
15 the heterogeneous mobile communication system setting up a packet data call with the mobile terminal and the heterogeneous mobile communication system providing the mobile terminal with packet data service.

3. The method as claimed in claim 1, wherein the mobile  
20 communication system provides voice service and packet data service and the heterogeneous mobile communication system provides packet data service.

4. The method as claimed in claim 1, wherein the location  
information further includes a first identifier;

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5. The method as claimed in claim 4 further comprising a step of the heterogeneous mobile communication system registering the first identifier and the location information.

30 6. The method as claimed in claim 5, wherein the heterogeneous

mobile communication system changes the first identifier to a second identifier which is randomly generated to identify the mobile terminal .

7. The method as claimed in claim 1, wherein the location  
5 registration message further includes information to determine whether or not the heterogeneous mobile communication system registers the location information of the mobile terminal.

8. A method of cross-paging from mobile communication systems  
10 to a mobile terminal, the method comprising the steps of:

determining whether the mobile terminal has been location-registered  
in the mobile communication system or in the heterogeneous mobile  
communication system with reference to pre-registered location information of  
the mobile terminal when paging request of the mobile terminal occurs in the  
15 heterogeneous mobile communication system;

transmitting a cross-paging message from the the heterogeneous mobile  
communication system to the mobile communication system if the mobile  
terminal has been location-registered in the mobile communication system; and

transmitting a paging message to the mobile terminal in response to the  
20 cross-paging message in the mobile communication system.

9. The method as claimed in claim 8, wherein the heterogeneous  
mobile communication system determines that the mobile terminal has been  
location-registered in the mobile communication system if a pre-registered  
25 identifier is a first identifier for identification in the mobile communication  
system, and that the mobile terminal has been location-registered in the mobile  
communication system if a pre-registered identifier is a second identifier for  
identification in the heterogeneous mobile communication system.

30 10. The method as claimed in claim 8, wherein the cross-paging

message includes information for requesting that a data call is set up with the heterogeneous mobile communication system.

11. The method as claimed in claim 8, wherein the mobile  
5 communication system provides voice service and packet data service and the heterogeneous mobile communication system provides packet data service.

12. The apparatus of cross-paging in mobile communication systems, the apparatus comprising:

10 a mobile terminal for generating location registration message and transmitting the location registration message to a mobile communication system.

a mobile communication system for transmitting location information of the mobile terminal to a heterogeneous mobile communication system;

15 a heterogeneous mobile communication system for requesting the mobile communication system to page the mobile terminal according to the received information.

13. The apparatus of claim 12, wherein the location information  
20 further includes a first identifier;

14. The apparatus of claim 12, wherein the mobile communication system provides voice service and packet data service and the heterogeneous mobile communication system provides packet data service.

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15. The apparatus of claim 12, wherein the location information further includes information to determine whether or not the heterogeneous mobile communication system registers the location information of the mobile terminal.

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16. The apparatus of claim 12, wherein the mobile communication system pages to the mobile terminal.

17. The apparatus of claim 13, wherein the heterogeneous mobile communication system sets up a packet data call with the mobile terminal , provides the mobile terminal with packet data service and registers the first identifier and the location information. .

18. The apparatus of claim 13, wherein the heterogeneous mobile communication system changes the first identifier to a second identifier which is randomly generated to identify the mobile terminal .